

WHAT IS CLAIMED IS:

1. A system for monitoring and control of a minimally invasive surgical procedure for a targeted tissue, the system comprising:

an endoscope, said endoscope comprises:

an input conduit for receiving an input for the targeted tissue; and

an output conduit for sending output from the targeted tissue;

an input mechanism for providing input to the targeted tissue through said input conduit of said endoscope;

a thermal output receiver for receiving thermal information from the targeted tissue through said output conduit of said endoscope; and

a processor in communication with said input mechanism and said thermal output receiver, said processor configured to receive said thermal output from said thermal output receiver and to adjust said input mechanism so as to adjust said input to the targeted tissue based on said thermal output, and wherein said receiving and adjusting is performable during a real-time procedure.

2. The system of claim 1, wherein said endoscope is selected from the group consisting of gastroscope, laparoscope, arthroscope, cystoscope, ureteroscope, pharyngoscope, bronchoscope and nephroscope.

3. The system of claim 1, wherein said input conduit comprises a laser beam conduit and wherein said input is a laser beam.

4. The system of claim 3, further comprising a flexible hollow waveguide placed within said input conduit, and wherein said flexible hollow waveguide is suitable for receiving an infrared laser beam therethrough.

5. The system of claim 1, wherein said input conduit comprises several input conduits.

6. The system of claim 5, wherein at least one of said several input conduits selected from the group consisting of a gas insufflation conduit, a suction conduit, a surgical tool conduit, and an illumination conduit.

7. The system of claim 1, wherein said output conduit is a viewing conduit.

8. The system of claim 7, wherein said viewing conduit is an infrared viewing conduit.

9. The system of claim 8, further comprising an infrared imaging fiber bundle, wherein said bundle is placed within said infrared viewing conduit for infrared thermal imaging of the tissue.

10. The system of claim 1, wherein said input mechanism is selected from the group consisting of a laser generator, a gas insufflator and a suction provider.

11. The system of claim 1, wherein said thermal output receiver is an infrared thermal output receiver.

12. The system of claim 11, wherein said infrared thermal output receiver is an infrared camera.

13. The system of claim 1, wherein said processor comprises a controller for controlling said input and based on said thermal output.

14. The system of claim 13, wherein said processor further comprises a thermal reader for reading said thermal output and incorporating said thermal output into a usable format.

15. The system of claim 14, wherein said usable format is a map.

16. The system of claim 14, wherein said usable format is a database.

17. A device for introduction of an infrared laser to a target tissue, the device comprising:

an endoscope having a conduit; and

a flexible hollow wave guide placed within said conduit, wherein said flexible hollow waveguide comprises: a hollow tube; a metal layer on the inner surface of the hollow tube; and a thin dielectric film of silver iodide over said metal layer.

18. The device of claim 17, wherein said endoscope is selected from the group consisting of gastroscope, laparoscope, arthroscope, cystoscope, ureterscope, pharyngoscope, bronchoscope and nephroscope.

19. The device of claim 17, further comprising:

a infrared laser generator in communication with said endoscope for generating an infrared laser beam through said flexible hollow waveguide to the target tissue.

20. The device of claim 19, further comprising:

a feedback device in communication with the target tissue, said feedback device configured to receive output information from the target tissue upon application of said infrared laser beam.

21. The device of claim 20, wherein said feedback device is a thermal receiver and wherein said output information is thermal information from the target tissue.

22. The device of claim 21, wherein said thermal receiver comprises an infrared camera.

23. The device of claim 22, wherein said thermal receiver further comprises an infrared imaging fiber bundle in communication with said camera, said infrared imaging fiber bundle positioned through an additional conduit in said endoscope.

24. The device of claim 20, further comprising a processor in communication with said feedback device and said infrared laser generator, wherein said processor is configured to receive said output information from said feedback device and to adjust parameters of said infrared laser beam generated by said infrared laser generator based on said received output information.

25. A system for monitoring and control of thermal properties of tissue during a minimally invasive surgical procedure, the system comprising:

an endoscope, said endoscope comprises:

a laser delivery conduit having a flexible hollow waveguide for delivery of an infrared laser to the tissue; and

an imaging conduit having an infrared imaging fiber bundle placed within said imaging conduit for reading thermal properties of the tissue;

a laser generator for providing an infrared laser to the tissue through said laser delivery conduit of said endoscope;

an infrared camera for receiving thermal information from the targeted tissue through said imaging conduit of said endoscope; and

a processor in communication with said laser generator and said infrared camera, said processor configured to receive said thermal information from said infrared camera and to adjust said laser generator so as to adjust parameters of said laser provided to the tissue based on said thermal information, and wherein said receiving and adjusting is performable during a real-time procedure.

26. The system of claim 25, wherein said endoscope is selected from the group consisting of gastroscope, laparoscope, arthroscope, cystoscope, ureteroscope, pharyngoscope, bronchoscope and nephroscope.

27. The system of claim 25, further comprising a flexible hollow waveguide placed within said laser delivery conduit, and wherein said flexible hollow waveguide is suitable for receiving said infrared laser beam therethrough.

28. The system of claim 25, further comprising at least one additional input conduit.

29. The system of claim 28, wherein at least one of said additional input conduits is selected from the group consisting of a gas insufflation conduit, a suction conduit, a surgical tool conduit, and an illumination conduit.

30. The system of claim 25, wherein said processor comprises a controller for controlling said parameters of said laser based on said thermal information.

31. The system of claim 25, wherein said processor further comprises a thermal reader for reading said thermal information and incorporating said thermal information into a usable format.

32. The system of claim 31, wherein said usable format is a map.

33. The system of claim 31, wherein said usable format is a database.

34. A system for monitoring of minimally invasive surgery at a targeted site, the system comprising:

a device for surgical contact with the targeted site, wherein the device comprises a distal end and a proximal end, said distal end configured to contact the targeted site and said proximal end accessible to a user; and an opening at said distal end connected to an opening at said proximal end;

an infrared imaging fiber bundle having a distal end and a proximal end, said infrared imaging fiber bundle positioned within said device such that said distal end of said infrared imaging fiber bundle is located at said opening of said distal end of said device, and said proximal end of said infrared imaging fiber bundle is located at said

opening of said proximal end of said device, wherein said distal end of said infrared imaging fiber bundle is configured to receive output information from said targeted site, and said proximal end of said infrared imaging fiber bundle is configured to send said output information to an output device; and

an output device in communication with said proximal end of said infrared imaging fiber bundle.

35. The system of claim 34, wherein said device is an endoscope.

36. The system of claim 34, wherein said output device is an infrared thermal imager.

37. The system of claim 34, further comprising a processor, said processor configured to receive said output information and to organize said output information into a readable format.

38. The system of claim 37, wherein said readable format is a color-coded map.

39. The system of claim 37, wherein said readable format is a report.

40. A method for monitoring and control of a minimally invasive surgical procedure, the method comprising:

introducing an infrared laser beam to a surgical site, said introducing including using adjustable parameters;

measuring thermal properties of said surgical site in response to said introducing;

processing said measured thermal properties; and

adjusting said adjustable parameters based on said processing,

wherein said adjusting is done during a time frame of the minimally invasive surgical procedure, and wherein said steps can be repeated as many times as necessary so as to achieve acceptable thermal properties.